

	130	140	150	160	
1093	GGGGAAACCCAGCACGAGTGTCTGTC	CTACCCGCAT	CT		M. tuberculosis
422	GGGGAAACCCAGCACGAGTGTCTGTC	TTACCCG	TATCT		M. avium
422	GGGGAAACCCAGCACGAGTGTCTGTC	TTACCCG	TATCT		M. paratuberc.
507	GGGGAAACCCGGCACGAGTGTCTGTC	ACCC	AACT		M. phlei
432	GGGGAAACCCAAACAGAGTGTCTGTC	AA	TACCCG	TATCT	M. leprae
207	GGGGAAACCCAGCACGAGTGTCTGTC	AT	ACCCG	TATCT	M. gastri
150	GGGGAAACCCAGCACGAGTGTCTGTC	TTACCCG	TATCT		M. kansasii
2588	GGGGAAACCCGGCACGAGTGTCTGTC	ACCC	AGGCG	CT	M. smegmatis

	210	220	230	240	
1172	CATCTCAGTACCCGTAGGAG	AGAAAACAATTGTGATTCC			M. tuberculosis
501	CATCTCAGTACCCGTAGGAG	AGAAAACAATTGTGATTCC			M. avium
501	CATCTCAGTACCCGTAGGAG	AGAAAACAATTGTGATTCC			M. paratuberc.
586	CATCTCAGTACCCGTAGA	AGAAGAAAACAATTGTGATTCC			M. phlei
511	CATCTCAGTACCCGTAGGAG	AGAAAACAATTGTGATTCC			M. leprae
286	CATCTCAGTACCCGTAGGAG	AGAAAACAAAAGTGATTCC			M. gastri
229	CATCTCAGTACCCGTAGGAG	AGAAAACAAAAGTGATTCC			M. kansasii
2667	CATCTCAGT	CCCGTAGGAG	AGAAAACAAAATGTGATTCC		M. smegmatis

	330	340	350	360	
1289	TGTGGGAG	GATATGTCTCAGCGCTACCCGGCTGAGA-GG			M. tuberculosis
617	TGTGGGATT	GATATGTCTCAGCTCTACCTGGCTGAGG-GG			M. avium
617	TGTGGGATT	GATATGTCTCAGCTCTACCTGGCTGAGG-GG			M. paratuberc.
703	TGTGGGCCTGTC	GATCGTCCGCCGGCGATGGCAG			M. phlei
629	TGTGGGATTGG	TATGTCTCAGCTCTACCTGGTGAGG-GG			M. leprae
404	TGTGGGATCGATA	GTCTCAGCTCTACCCGGCTGAGG-GG			M. gastri
347	TGTGGGATCGATA	GTCTCAGCTCTACCCGGCTGAGG-GG			M. kansasii
2785	TGTGGGACCTATCTTC	CGCCCTCTACCTGGCTGAGG-GG			M. smegmatis

Figure 1A

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	370	380	390	400	
1327	CAGTCAGAAAGTGTCTGGTTAGCGGAAGTGGCTGGGAT				M. tuberculosis
656	TAGTCAGAAAGTGTCTGGTTAGCGGAAGTGGCTGGGAT				M. avium
656	TAGTCAGAAAGTGTCTGGTTAGCGGAAGTGGCTGGGAT				M. paratuberc.
742	TAGTCAGAAAGTGTCTGGTTAGCGGAAGTGGCTGGGAT				M. phlei
668	TAGTCAGAAAGTGTCTGGTTAGCGGAAGTGGCTGGGAT				M. leprae
443	CAGTCAGAAAGTGTCTGGTTAGCGGAAGTGGCTGGGAT				M. gastri
386	CAGTCAGAAAGTGTCTGGTTAGCGGAAGTGGCTGGGAT				M. kansasii
2823	CAGTCAGAAAGTGTCTGGTTAGCGGAAGTGGCTGGGAT				M. smegmatis

	450	460	470	480	
1406	CGGCACCTGCCTTAGTATCAATTCCCGAGTAGCAGCGGGCC				M. tuberculosis
735	CGGCACCTGCCTTATATCAACACCCGAGTAGCAGCGGGCC				M. avium
735	CGGCACCTGCCTTATATCAACACCCGAGTAGCAGCGGGCC				M. paratuberc.
820	TGCTGCCGTGTCACAGG-TCCCGAGTAGCAGCGGGCC				M. phlei
747	TGGCACCTGCCTTGTATCAATTCCCGAGTAGCAGCGGGCC				M. leprae
522	CGGCACCTGCCTTGTATCAATTCCCGAGTAGCAGCGGGCC				M. gastri
465	CGGCACCTGCCTTGTATCAATTCCCGAGTAGCAGCGGGCC				M. kansasii
2902	CGACGTCTGCTGATGGTTCCCGAGTAGCAGCGGGCC				M. smegmatis

	490	500	510	520	
1446	CGTGGAAATCGCTGTGAATCGCCGGGACCACCCGGTAAG				M. tuberculosis
775	CGTGGAAATCTGCTGTGAATCTGCCGGGACCACCCGGTAAG				M. avium
775	CGTGGAAATCTGCTGTGAATCTGCCGGGACCACCCGGTAAG				M. paratuberc.
857	CGTGGAAATCTGCTGTGAATCTGCCGGGACCACCCGGTAAG				M. phlei
787	CGTGGAAATCTGCTGTGAATCTGCCGGGACCACCCGGTAAG				M. leprae
562	CGTGGAAATCTGCTGTGAATCTGCCGGGACCACCCGGTAAG				M. gastri
505	CGTGGAAATCTGCTGTGAATCTGCCGGGACCACCCGGTAAG				M. kansasii
2942	CGTGGAAATCTGCTGTGAATCTGCCGGGACCACCCGGTAAG				M. smegmatis

Figure 1B

	610	620	630	640	
1566	GTACCTGAAACCGTGTGCCTACAATCCGTCAAGAGCCTCCT				M. tuberculosis
894	GTACCTGAAACCGTGTGCCTACAATCCGTCAAGAGCCTCCT				M. avium
894	GTACCTGAAACCGTGTGCCTACAATCCGTCAAGAGCCTCCT				M. paratuberc.
976	GTACCTGAAACCGTGTGCCTACAATCCGTCAAGAGCCTCCT				M. phlei
907	GTACCTGAAACCGTGTGCCTACAATCCGTCAAGAGCCTCCT				M. leprae
682	GTACCTGAAACCGTGTGCCTACAATCCGTCAAGAGCCTCCT				M. gastri
625	GTACCTGAAACCGTGTGCCTACAATCCGTCAAGAGCCTCCT				M. kansasii
3062	GTACCTGAAACCGTGTGCCTACAATCCGTCAAGAGCCTCCT				M. smegmatis
	650	660	670	680	
1606	TTTCCTCTCCGGAGGGGGTGGTGTGGCGTGCCTTTGA				M. tuberculosis
934	C-----GTGGGGGTGATGGCGTGCCTTTGA				M. avium
934	C-----GTGGGGGTGATGGCGTGCCTTTGA				M. paratuberc.
1016	CTT-----GTAGTGGGGGTGATGGCGTGCCTTTGA				M. phlei
947	T-----GTGGGGGTGATGGCGTGCCTTTGA				M. leprae
722	T-----GTGGGGGTGATGGCGTGCCTTTGA				M. gastri
665	C-----GTGGGGGTGATGGCGTGCCTTTGA				M. kansasii
3102	ACGTGT-----GTGGGGGTGATGGCGTGCCTTTGA				M. smegmatis
	690	700	710	720	
1646	AGAATGAGCCTGCGAGTCAGGGACATGTCGCAAGGTTAAC				M. tuberculosis
4	AGAATGAGCCTGCGAGTCAGGGACATGTCGCAAGGTTAAC				M. bovis
959	AGAATGAGCCTGCGAGTCAGGGACACGTCGCGAGGTTAAC				M. avium
23	AGAATGAGCCTGCGAGTCAGGGACACGTCGCGAGGTTAAC				M. intracellular
959	AGAATGAGCCTGCGAGTCAGGGACACGTCGCGAGGTTAAC				M. paratuberc.
1046	AGAATGAGCCTGCGAGTCAGGGACATGTCGCGAGGTTAAC				M. phlei
972	AGAATGAGCCTGCGAGTCAGGGACATGTCGCGAGGTTAAC				M. leprae
747	AGAATGAGCCTGCGAGTCAGGGACATGTCGCGAGGTTAAC				M. gastri
690	AGAATGAGCCTGCGAGTCAGGGACATGTCGCGAGGTTAAC				M. kansasii
3132	AGAATGAGCCTGCGAGTCAGGGACATGTCGCGAGGTTAAC				M. smegmatis

Figure 1C

	770	780	790	800	
1726	CGACCCACACGCGCATA	ACGCGCGTGTGAATAGTGGCGTGT			M. tuberculosis
84	CGACCCACACGCGCATA	ACGCGCGTGTGAATAGTGGCGTGT			M. bovis
1039	CG-----CATCCCGTTGGGTGT	-----	AGTGGCGTGT		M. avium
103	CG-----CATCCCGTTGGGTGT	-----	AGTGGCGTGT		M. intracellulat
1039	CG-----CATCCCGTTGGGTGT	-----	AGTGGCGTGT		M. paratuberc.
1126	CGTATCCAACCTGTTGGGTGT	-----	AGTGGGTGT		M. phlei
1052	CGTAT--CACGTTGAGCGTGT	-----	AGTGGCGTGT		M. leprae
827	CGTAT--CACGCGTAAGCGTGT	-----	AGTGGCGTGT		M. gastri
770	CGTAT--CGCGCGGAGCGTGT	-----	AGTGGCGTGT		M. kansasii
3212	CGTAT--CCACACAGAGTGTGT	-----	AGTGGGTGT		M. smegmatis

	970	980	990	1000	
1926	ATTTAGGTGCAGCGTTGCGTGGTT	CACC	GGGAGGGTAGAG		M. tuberculosis
1228	ATTTAGGTGCAGCGTTGCGTGGTT	CACC	ACGGAGGGTAGAG		M. avium
1228	ATTTAGGTGCAGCGTTGCGTGGTT	CACC	ACGGAGGGTAGAG		M. paratuberc.
1322	ATTTAGGTGCAGCGT	GCATG	TTCTTATCGGAGGGTAGAG		M. phlei
1244	ATTTAGGTGCAGCGTTGCGTGGTT	CACC	ACGGAGGGTAGAG		M. leprae
1019	ATTTAGGTGCAGCGTTGCGT	TTTCACC	ACGGAGGGTAGAG		M. gastri
962	ATTTAGGTGCAGCGTTGCGT	TTTCACC	ACGGAGGGTAGAG		M. kansasii
3408	ATTTAGGTGCAGCGT	GCATG	TTCTGGCGAGGTAGAG		M. smegmatis

	1050	1060	1070	1080	
2005	CAGCCAAACTCCGAATGCCG	TGGTG	TA-AAGCGTGGCA		M. tuberculosis
1307	CAGCCAAACTCCGAATGCCG	TGGTG	TAAGCGTGGCA		M. avium
1307	CAGCCAAACTCCGAATGCCG	TGGTG	TAAGCGTGGCA		M. paratuberc.
1401	CAGCCAAACTCCGAATGCCG	TAAG	TAAAGCGTGGCA		M. phlei
1323	CAGCCAAACTCCGAATGCCG	TGGTG	TAAGCGTGGCA		M. leprae
1098	CAGCCAAACTCCGAATGCCG	TGGTG	TATAAGCGTGGCA		M. gastri
1041	CAGCCAAACTCCGAATGCCG	TGGTG	TATAAGCGTGGCA		M. kansasii
3486	CAGCCAAACTCCGAATGCCG	TAAGG	AAAGAGCGGGAA		M. smegmatis

Figure 1D

	1130	1140	1150	1160	
2082	ACAGCCCAGATCGCCGGCTAAGGCCC	CAAGCGTGTGCTA	M. tuberculosis		
1385	ACAGCCCAGATCGCCGGCTAAGGCCC	CAAGCGTGTGCTA	M. avium		
1385	ACAGCCCAGATCGCCGGCTAAGGCCC	CAAGCGTGTGCTA	M. paratuberc.		
1479	ACAGCCCAGATCGCCGGCTAAGGCCC	CAAGCGTGTGCTA	M. phlei		
1401	ACAGCCCAGATCGCCGGCTAAGGCCC	CAAGCGTGTGCTA	M. leprae		
1175	ACAGCCCAGATCGCCGGCTAAGGCCC	CAAGCGTGTGCTA	M. gastri		
1118	ACAGCCCAGATCGCCGGCTAAGGCCC	CAAGCGTGTGCTA	M. kansasii		
3566	ACAGCCCAGATCGCCGG	TAAGGCCC	CAAGCGT	GTGCTA	M. smegmatis

- - -

	1290	1300	1310	1320	
2241	CTCAAGCACACCGCCGAAGCCGGCACAT	CCACCTTGT-	M. tuberculosis		
1544	CTCAAGCACACCGCCGAAGCCGGCACAT	TCATCTT-TA	M. avium		
1544	CTCAAGCACACCGCCGAAGCCGGCACAT	TCATCTT-TA	M. paratuberc.		
1638	CTCAAGCACACCGCCGAAGCCGGCA-	ATCAGGCTTTG	M. phlei		
1560	CTCAAGCACACCGCCGAAGCCGGCACAT	TCACCTTCTA	M. leprae		
1334	CTCAAGCACACCGCCGAAGCCGCGA	CA-----ACCGC--A	M. gastri		
1277	CTCAAGCACACCGCCGAAGCCGCGA	CA-----ACCGC--A	M. kansasii		
3726	CTCAAGCACACCGCCGAAGCCGCGA	AA-----GCCAACGT	TTG		M. smegmatis

	1330	1340	1350	1360	
2280	-GGTGGGTG	TGGGTAGGGGAGCGTCCCT	CATTCA	GCGAAG	M. tuberculosis
1583	GGGTGG	TGTGGGTAGGGGAGCGTCCC	CATTCA	GCGAAG	M. avium
1583	GGGTGG	TGTGGGTAGGGGAGCGTCCC	CATTCA	GCGAAG	M. paratuberc.
1676	TGG	GGGTGGTGGGTAGGGGAGCGT	CATTCA	GCGAAG	M. phlei
1600	GGGTGG	TGTGGGTAGGGGAGCGT	CCTCATT	GCGAAG	M. leprae
1367	AGGT	TGGGTAGGGGAGCGTCCCT	CATTCA	GCGAAG	M. gastri
1310	AGGT	TGGGTAGGGGAGCGTCCC	CATTCA	GCGAAG	M. kansasii
3764	TT	TGGGTAGGGGAGCGTCC	TG-ATCGG	TGAAG	M. smegmatis

Figure 1E

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1370 1380 1390 1400

2319 **CCAC**GGGTGACCGGTGGTGAGGGTGGGGAGTGAGAAT M. tuberculosis
1623 CT-CCGGGTGACCGGTGGTGAGGGTGGGGAGTGAGAAT M. avium
1623 CT-CCG~~GGT~~GA**T**CGGTGGTGAGGGTGGGGAGTGAGAAT M. paratuberc.
1716 CCGCCG**A**GTGA**T**CGGTGGTGAGGGTGGGGAGTGAGAAT M. phlei
1640 CCTCCGGGT**A**CCGGTGAGGGTGGGGAGTGAGAAT M. leprae
1402 CCGCCGGGTGACCGGTGGTGAGG**A**TGGGGAGTGAGAAT M. gastri
1345 CTGCCGGGTGACCGGTGGTGAGG**A**TGGGGAGTGAGAAT M. kansasii
3796 CCGCCG**A**GT**A**T**C**GAGTGGTGAGGGTGGGGAGTGAGAAT M. smegmatis

1410 1420 1430 1440

2359 GCAGGCATGAGTAGCGA**A**AGGCAAGTGAGAACCTTGC**CC** M. tuberculosis
1662 GCAGGCATGAGTAGCGA**A**AGGCAAGTGAGAACCTTGC**CC** M. avium
1662 GCA~~GG~~CATGAGTAGCGA**A**AGGCAAGTGAGAACCTTGC**CC** M. paratuberc.
1756 GCAGGCATGAGTAGCGA**A**AGGCAAGTGAGAACCTT**C****CC** M. phlei
1680 GCAGGCATGAGTAGCGA**A**AGGCAAGTGAGAACCTTGC**CC** M. leprae
1442 GCAGGCATGAGTAGCGA**A**AGGCAAGTGAGAACCTTGC**CC** M. gastri
1385 GCAGGCATGAGTAGCGA**A**AGGCAAGTGAGAACCTTGC**CC** M. kansasii
3836 GCAGGCATGAGTAGCGA**A**AGGCAAGTGAGAACCTT**C****CC** M. smegmatis

1570 1580 1590 1600

2519 CG**CCC**GTGAC**A**ATCA-GCGGTACTAACCAACCCAAAACCG M. tuberculosis
1821 CG**T**CCCGTGAT**A**ATCA-GCGGTACTAACCAACCCAAAACCG M. avium
1821 CG**T**CCCGTGAT**A**ATCA-GCGGTACTAACCAACCCAAAACCG M. paratuberc.
1915 CG**T**CCCGTGAT**A**AT**C**T**C**ATT**T****G**CTAACCAACCCAAAACCG M. phlei
1840 CGCCCGTGAT**A**ATCA-GCGGTACTAACCAACCCAAAACCG M. leprae
1602 CGCCCGTGAT**A**ATCA-GCGGTACTAACCAACCCAAAACCG M. gastri
1545 CGCCCGTGAT**A**ATCA-GCGGTACTAACCAACCCAAAACCG M. kansasii
3996 CG**T**CC**A**T**G**AT**A**ATCA-GCGGTACTAACCA**T**CCAAAACCG M. smegmatis

Figure 1F

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1610 1620 1630 1640

2558 GAT-CGATCAC-TCCCCTTCGGGGG-TGTGGAGTTC-TGG M. tuberculosis
1860 GAT-CGACAT-TCCCCTTCGGGGC-GTGGCGATT-CGG M. avium
1860 GAT-CGACAT-TCCCCTTCGGGGC-GTGGCGATT-CGG M. paratuberc.
1955 GGC-CGATC-ATCC-TTCGGGG-GTGGACGGTTTG-GG M. phlei
1879 GAT-CGACATATCCCCTTCGGGGGATATGGAGGTT-CGG M. leprae
1641 GAT-CGATCAC-TCCCCTTCGGGGG-GTGGAGGTC-TGG M. gastri
1584 GAT-CGATCAC-TCCCCTTCGGGGC-GTGGAGGTC-TGG M. kansasii
4035 ACCGTGAACGCACCT-TTCGGGG-TGTGGCGTTGGTGG M. smegmatis

1650 1660 1670 1680

2594 GGCTGCGTGGGAACCTCGCTGGTAGTAGTCAGG-GAAAGGG M. tuberculosis
1896 GGCTGCGTGGGAACCTCGCTGGTAGTAGTCAGGAAATGGG M. avium
1896 GGCTGCGTGGGAACCTCGCTGGTAGTAGTCAGGAAATGGG M. paratuberc.
1986 GGCTGCGTGGGAACCG-GTGGGTAGTAGTCAGGCAATGGG M. phlei
1917 GGCTGCGTGGGAACCTCGCTGGTAGTAGTCAGGCAATGGG M. leprae
1677 GGCTGCGTGGAGAACCTCGCTGGTAGTAGTCAGGCAATGGG M. gastri
1620 GGCTGCGTGGAGAACCTCGCTGGTAGTAGTCAGGCAATGGG M. kansasii
4071 GGCTGCAATGGGAACCTCGCTGGTAGTAGTCAGGCAATGGG M. smegmatis

1690 1700 1710 1720

2634 -GTGACGCAGGAAGGTAGCCGTACCAAGTCAGTGGTAATA- M. tuberculosis
1936 -GTGACGCAGGAAGG-GAGCCGTACCAAGTCAGTGGTAATA- M. avium
1936 -GTGACGCAGGAAGG-GAGCCGTACCAAGTCAGTGGTAATA- M. paratuberc.
2025 -GTGACGCAGGAAGGTAGCCGTACCAAGTCAGTGGTAATA- M. phlei
1957 -GTGACGCAGGAAGGTAGCCGTACCAAGTCAGTGGTAATA- M. leprae
1717 -GTGACGCAGGAAGG-GAGCCGTACCAAGTCAGTGGTAATA- M. gastri
1660 -GTGACGCAGGAAGG-GAGCCGTACCAAGTCAGTGGTAATA- M. kansasii
4111 -GTGACGCAGGAAGGTAGCCGTACCGGGTCAGTGGTAATA- M. smegmatis

Figure 1G

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	1730	1740	1750	1760	
2672	-CTGGGGCAAGCC	GGTAGGGAGAGCGATAGGCAAATCCGT			M. tuberculosis
1974	-CTGGGGCAAGCC	CGTAG	-AGAGCGATAGGCAAATCCGT		M. avium
1974	-CTGGGGCAAGCC	CGTAG	-AGAGCGATAGGCAAATCCGT		M. paratuberc.
2063	-C	GGGGTAAACCT	GTAGGGGAGAGCGATAGGCAAATCCGT		M. phlei
1995	-CTGGAGCAAGCC	GTAGGGAGAGCGATAGGCAAATCCGT			M. leprae
1755	-CTGGGGCAAGCC	AGTAGGGAGAGCGATAGGCAAATCCGT			M. gastri
1698	-CTGGGGCAAGCC	AGTAGGGAGAGCGATAGGCAAATCCGT			M. kansasii
4149	-C	GGGTAAGCC	GTAGGGAGTCAGATAGGAAATCCGT		M. smegmatis

	1970	1980	1990	2000	
2908	AGGGGGACCGGAATAT	CGTGAACACCCTTGC GG TGAGC			M. tuberculosis
2208	AGGGGGCCCGGAATAC	CGTGAACACCCTTGC GG TGAGC			M. avium
2208	AGGGGGCCCGGAATAC	CGTGAACACCCTTGC GG TGAGC			M. paratuberc.
2298	AGGGGGACCCACG	TACCGTGAAGGGC	TCTTGC GG GGG	AGC	M. phlei
2231	AGGGGGCCCGGAATAT	CGTGAACACCCTTGC GG TGAGC			M. leprae
1910					M. gastri
1934	AGGGGGACCGGAATA	CGTGAACACCCTTGC GG TGAGC			M. kansasii
4385	AGGGGGACCCAC	ATGGCGTGAAAGCC	TTACGGCC	AGC	M. smegmatis

	2410	2420	2430	2440	
3345	AC	CTCGACGCCAGTTGGGGC	GGAGTCGTTGTTGAAATACC		M. tuberculosis
284	ACCTCGACGCCAGT	TTGGGGCGGAGTCGTTGTTGAAATACC			M. bovis
2645	GC	ACAGACGCCAGTT	TGGAGTCGTTGTTGAAATACC		M. avium
393	ATACAGACGCCAGTT	TGATGGAGTCGTTGTTGAAATACC			M. intracellulare
2645	GC	ACAGACGCCAGTT	TGGAGTCGTTGTTGAAATACC		M. paratuberc.
2737	GCTCG	GACGCCAGTT	GGGTGGAGTCGTTGTTGAAATACC		M. phlei
2668	AC	TCGACGC	TAGTTGGGTGGAGTCGTTGTTGAAATACC		M. leprae
1910					M. gastri
2372	ACCTC	AACGCCAGT	GGGGTGGAGTCGTTGTTGAAATACC		M. kansasii
4822	GC	TCACGCCAGT	GTGGGTGGAGTCGTTGTTGAAATACC		M. smegmatis

Figure 1H

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	2450	2460	2470	2480	
3385	ACTCTGATCGTATTGG	GCATCTAACCTCGAACCCCTGAATC			M. tuberculosis
324	ACTCTGATCGTATTGGGCATCTAACCTCGAACCCCTGAATC				M. bovis
2685	ACTCTGATCGTATTGGACACCTAACGTCGAACCCCT		TATC		M. avium
433	ACTCTGATCGTATTGGACACCTAACGTCGAACCCCT	TATC			M. intracellulare
2685	ACTCTGATCGTATTGGACACCTAACGTCGAACCCCT	TATC			M. paratuberc.
2777	ACTCTGATCGTATTGGCCTCTAACCTCGAACCGTGGATC				M. phlei
2708	ACTCTGATGTATTGAACTCTAACCTCGAACCGTATATC				M. leprae
1910					M. gastri
2412	ACTCTGATCGTATTGGACACCTAACGTCGAACCCCTGAATC				M. kansasii
4862	ACTCTGATCGTATTGGCCTCTAACCTCGAACCGTATATC				M. smegmatis

	2490	2500	2510	2520	
3425	GGGTTTAGGGACAGTGCCTGGCGGGTAGTTAACCTGGGGC				M. tuberculosis
364	GGGTTAGGGACAGTGCCTGGCGGGTAGTTAACCTGGGGC				M. bovis
2724	GGGTTCAAGGGACAGTGCCTGGCGGGTAGTTAACCTGGGGC				M. avium
472	GGGTTCAAGGGACAGTGCCTGGCGGGTAGTTAACCTGGGGC				M. intracellulare
2724	GGGTTCAAGGGACAGTGCCTGGCGGGTAGTTAACCTGGGGC				M. paratuberc.
2817	GGGTTCAAGGGACAGTGCCTGGGGTAGTTAACCTGGGGC				M. phlei
2748	GGGTTAGGGACAGTGCCTGGCGGGTAGTTAACCTGGGGC				M. leprae
1910					M. gastri
2452	GGGTTCAAGGGACAGTGCCTGGCGGGTAGTTAACCTGGGGC				M. kansasii
4902	GGGTTCAAGGGACAGTGCCTGGGGTAGTTAACCTGGGGC				M. smegmatis

	2930	2940	2950	2960	
3864	AGTACGAGAGGACCAGGGACGGACGAACCTCTGGTGGACCA				M. tuberculosis
3163	AGTACGAGAGGACCAGGGACGGACGAACCTCTGGTATACCA				M. avium
3163	AGTACGAGAGGACCAGGGACGGACGAACCTCTGGTATACCA				M. paratuberc.
3256	AGTACGAGAGGACCAGGGACGGACGAACCTCTGGTATACCA				M. phlei
3187	AGTACGAGAGGACCAGGGACGGACGAACCTCTGGTATACCA				M. leprae
1910					M. gastri
2891	AGTACGAGAGGACCAGGGACGGACGAACCTCTGGTACGTGCACCA				M. kansasii
5342	AGTACGAGAGGACCAGGGACGGACGAACCTCTGGTATACCA				M. smegmatis

Figure 11

10/31

	2970	2980	2990	3000	
3904	GTTGT	CCC	G	CAGGGGGCACCGCTGGATAGCCACGTTCGGA	M. tuberculosis
3203	GTTGT	CCC	A	CCAGGGGCACGGCTGGATAGCCACGTTCGGA	M. avium
3203	GTTGT	CCC	A	CCAGGGGCACGGCTGGATAGCCACGTTCGGA	M. paratuberc.
3296	GTTGT	CCC	A	CCAGGGGCACCGCTGGATAGCCACGTTCGGA	M. phlei
3227	GTTGT	TC	A	CCAGGGGCACCGCTGGATAGCCACGTTCGGA	M. leprae
1910					M. gastri
2931	GTTGT	CCC	A	CCAGGGGCACCGCTGGATAGC	M. kansasii
5382	GTTGT	CCC	A	CCAGGGGCACGCTGGATAGCCACGTTCGGA	M. smegmatis

	3010	3020	3030	3040	
3944	CAGGATA	ACC	GCTGAAAGCATCTAAGCGGGAAACCTTCTC	M. tuberculosis	
3243	CAGGATA	ACC	GCTGAAAGCATCTAAGCGGGAAACCTTCTC	M. avium	
3243	CAGGATA	ACC	GCTGAAAGCATCTAAGCGGGAAACCTTCTC	M. paratuberc.	
3336	CAGGATA	ACC	GCTGAAAGCATCTAAGCGGGAAACCT	M. phlei	
3267	CA	GATA	ACC	GCTGAAAGCATCTAAGCGGGAAACCTTCTC	M. leprae
1910					M. gastri
2971	CAGGATA	ACC	GCTGAAAGCATCTAAGCGGGAAACCTTCTC	M. kansasii	
5422	CAGGATA	ACC	GCTGAAAGCATCTAAGCGGGAAACCT	M. smegmatis	

	3090	3100	3110	3120				
4023	CCCGC	-AGAACACGGG	TTC	AA	TAGGT	CAGACCTGGAAAGCT	M. tuberculosis	
609	CCCGC	-AGAACACGGG	TTC	AA	TAGGT	CAGACCTGGAAAGCT	M. bovis	
3322	CCCGC	-AGA	CACGGG	A	TG	ATAGG	CAGACCTGGAAAGCT	M. avium
677	CCCGC	-AGA	CACGGG	T	G	ATAGG	CAGACCTGGAAAGCT	M. intracellulare
3322	CCCGC	-AGA	CACGGG	T	G	ATAGG	CAGACCTGGAAAGCT	M. paratuberc.
3415	CCCGC	-AGA	CACGGG	A	TG	ATAGG	CAGACCTG	M. phlei
3309								M. leprae
1910								M. gastri
3050	CCCGC	-AGAACACGGG	TTC	GA	TAGG	CAGACCTGGAAAGCT	M. kansasii	
5501	CCCGC	-AGA	CACGGG	A	TG	ATAGG	CAGACCTGG	M. smegmatis

Figure 1J

11/31

	50	60	70	80	
2	GC GGCGT GCTTAACACATGCAAGTCGAACGGAAAG	GTCTC			M. tuberculosis
141	GC GGCGT GCTTAACACATGCAAGTCGAACGGAAAGG	GTCTC			M. bovis
39	GC GGCGT A CTTAACACATGCAAGTCGAACGGAAAGG	GTCTC			M. avium
1	----- TTAACACATGCAAGT G AAACGGAAAGG	ACCC			M. intracellulare
39	GC GGCGT GCTTAACACATGCAAGTCGAACGGAAAGG	GTCTC			M. paratuberc.
2	GC GGCGT GCTTAACACATGCAAGTCGAACGGAAAGG	ACCC			M. scrofulaceum
40	GC GGCGT GCTTAACACATGCAAGTCGAACGGAAAGG	GTCTC			M. leprae
2	----- CG GGCGT GCTTAACACATGCAAGTCGAACGGAAAGG	GTCTC			M. kansasii
2	GC GGCGT GCTTAACACATGCAAGTCGAACGGAAAGG	GTCTC			M. gastri
40	GC GGCGT GCTTAACACATGCAAGTCGAACGG G AAGG	CTTC			M. gordonae
1	----- GTGCTTAACACATGCAAGTCGAACGGAAAGG	GTCTC			M. marinum
	90	100	110	120	
42	T-----TCGG A GATACTCGAGTGGCGAACGGGT				M. tuberculosis
181	T-----TCGGAGA T ACTCGAGTGGCGAACGGGT				M. bovis
79	T-----TCGGAGG T ACTCGAGTGGCGAACGGGT				M. avium
32	T-----TCGG G G-TACTCGAGTGGCGAACGGGT				M. intracellulare
79	T-----TCGGAGG T ACTCGAGTGGCGAACGGGT				M. paratuberc.
42	T-----TCGG G G-TACTCGAGTGGCGAACGGGT				M. scrofulaceum
80	TAAAAAA TCTTT T TAGAGA T ACTCGAGTGGCGAACGGGT				M. leprae
41	T-----TCGGAGA T ACTCGAGTGGCGAACGGGT				M. kansasii
42	T-----TCGGAGA T ACTCGAGTGGCGAACGGGT				M. gastri
80	----- GGG T AC T CGAGTGGCGAACGGGT				M. gordonae
36	T-----TCGGAGA T ACTCGA T GGCGAACGGGT				M. marinum
	130	140	150	160	
70	GAGTAACACGTGGG T GATCTGCCCTGCAC TC -GGGATAA				M. tuberculosis
209	GAGTAACACGTGGG T GATCTGCCCTGCAC TC -GGGATAA				M. bovis
107	GAGTAACACGTGGG C AATCTGCCCTGCAC TC -GGGATAA				M. avium
59	GAGTAACACGTGGG C AATCTGCCCTGCAC TC -GGGATAA				M. intracellulare
107	GAGTAACACGTGGG C AATCT A CCCTGCAC TC -GGGATAA				M. paratuberc.
70	GAGTAACACGTGGG C AATCTGCCCTGCAC TC -GGGATAA				M. scrofulaceum
120	GAGTAACACGTGGG T AATCTGCCCTGCAC T GGGATAA				M. leprae
69	GAGTAACACGTGGG C AATCTGCCCTGCAC AC -GGGATAA				M. kansasii
70	GAGTAACACGTGGG C AATCTGCCCTGCAC AC -GGGATAA				M. gastri
104	GAGTAACACGTGGG T AATCTGCCCTGCAC T GGGATAA				M. gordonae
64	GAGTAACACGTGGG G GATCTGCCCTGCAC TC -GGGATAA				M. marinum

Figure 2A

12/31

170 180 190 200

109 GCCTGGGAAACTGGTCTAATACCGGATAGGA[CACGGGA] M.tuberculosis
248 GCCTGGGAAACTGGTCTAATACCGGATAGGACCACGGGA M.bovis
146 GCCTGGGAAACTGGTCTAATACCGGATAGGACCTCAAGA M.avium
98 GCCTGGGAAACTGGTCTAATACCGGATAGGACCTTAGG M.intracellulare
146 GCCTGGGAAACTGGTCTAATACCGGATAGGACCTCAAGA M.paratuberc.
109 GCCTGGGAAACTGGTCTAATACCGGATAGGACCACTTGG M.scrofulaceum
160 GCCTGGGAAACTGGTCTAATACCGGATAGGACCTCAAGG M.leprae
108 GCCTGGGAAACTGGTCTAATACCGGATAGGACCACTTGG M.kansasii
109 GCCTGGGAAACTGGTCTAATACCGGATAGGACCTGG M.gastri
143 GCCTGGGAAACTGGTCTAATACCGGATAGGACCACGGGA M.gordonae
103 GCCTGGGAAACTGGTCTAATACCGGATAGGACCACGGGA M.marinum

210 220 230 240

149 TGCA[TGTCTTGTTGGAAAGCGCTTTAGCGGTGTGGGAT M.tuberculosis
288 TGCA[TGTCTTGTTGGAAAGCGCTTTAGCGGTGTGGGAT M.bovis
186 CGCATGTCTTGTGGTGGAAAGC[TTTT]ACGGTGTGGGAT M.avium
138 CGCATGTCTTGTGGTGGAAAGC[TTT]CGGGTGTGGGAT M.intracellulare
186 CGCATGTCTTGTGGTGGAAAGC[TTTT]CGGGTGT[GAA]T M.paratuberc.
149 CGCATGCTTGTGGTGGAAAGC[TTT]CGGGTGTGGGAT M.scrofulaceum
200 CGCATGTCTTGTGGTGGAAAGC[TTTT]CGGGTGT[GAGG]AT M.leprae
148 CGCATGCTTGTGGTGGAAAGC[TTT]CGGGTGTGGGAT M.kansasii
149 CGCATGCTTGTGGTGGAAAGC[TTT]CGGGTGTGGGAT M.gastri
183 CACATGTCTTGTGGTGGAAAGC[TTTT]CGGGTGTGGGAT M.gordonae
143 T[CATGTCTTGTGGTGGAAAGC[CTTT]CGGGTGTGGGAT M.marinum

250 260 270 280

189 GAGCCC[GCGGCCTATCAGCTTGGTGGGTGACGGCCT M.tuberculosis
328 GAGCCC[GCGGCCTATCAGCTTGGTGGGTGACGGCCT M.bovis
224 GGGCCC[GCGGCCTATCAGCTTGGTGGGTGACGGCCT M.avium
176 GGGCCC[GCGGCCTATCAGCTTGGTGGGTGACGGCCT M.intracellulare
224 GGGCCC[GCGGCCTATCAGCTTGGTGGGTGACGGCCT M.paratuberc.
187 GGGCCC[GCGGCCTATCAGCTAGTTGGTGGGTGACGGCCT M.scrofulaceum
239 GGGCCC[GCGGCCTATCAGCTAATTAGTGGGTGACGGCCT M.leprae
186 GGGCCC[GCGGCCTATCAGCTTGGTGGGTGACGGCCT M.kansasii
187 GGGCCC[GCGGCCTATCAGCTTGGTGGGTGACGGCCT M.gastri
221 GGCCC[GCGGCCTATCAGCTTGGTGGGTGACGGCCT M.gordonae
181 GGGCCC[GCGGCCTATCAGCTTGGTGGGTGACGGCCT M.marinum

Figure 2B

13/31

	450	460	470	480	
389	AAACCTTTCACCATCGACGAAGGTCCGGGTT	CTCTCGG			M. tuberculosis
528	AAACCTTTCACCATCGACGAAGGTCCGGGTT	CTCTCGG			M. bovis
424	AAACCTTTCACCATCGACGAAGGTCCGGGTT	CTCTCGG			M. avium
376	AAACCTTTCACCATCGACGAAGGTCCGGGTT	CTCTCGG			M. intracellulare
424	AAACCTTTCACCATCGACGAAGGTCCGGGTT	CTCTCGG			M. paratuberc.
387	AAACCTTTCACCATCGACGAAGGCTCA---CTTG	TGG			M. scrofulaceum
439	AAACCTTTCACCATCGACGAAGGTCTGGGAAITCTCGG				M. leprae
386	AAACCTTTCACCATCGACGAAGGTCCGGGTTCTCTCGG				M. kansasii
387	AAACCTTTCACCATCGACGAAGGTCCGGGTTCTCTCGG				M. gastri
420	AAACCTTTCACCATCGACGAAGGTCCGGGTTCTCTCGG				M. gordonae
381	AAACCTTTCACCATCGACGAAGGTCTGGGTTCTCTCGG				M. marinum

	1130	1140	1150	1160	
1069	TCTCATGTTGCCAGGACGTAATGGT	GGGGACTCGTGAGAG			M. tuberculosis
1208	TCTCATGTTGCCAGCACGTAATGGT	GGGGACTCGTGAGAG			M. bovis
1104	TCTCATGTTGCCAGCGGGTAATGC	GGGGACTCGTGAGAG			M. avium
1056	TCTCATGTTGCCAGCGGGTAATGC	GGGGACTCGTGAGAG			M. intracellulare
1098	TCTCATGTTGCCAGCGGGTAATGC	GGGGACTCGTGAGAG			M. paratuberc.
1064	TCTCATGTTGCCAGCGGGTAATGC	GGGGACTCGTGAGAG			M. scrofulaceum
1119	TCTCATGTTGCCAGCACGTAATGGT	GGGGACTCGTGAGAG			M. leprae
1066	TCTCATGTTGCCAGCGGGTAATGC	GGGGACTCGTGAGAG			M. kansasii
1067	TCTCATGTTGCCAGCGGGTAATGC	GGGGACTCGTGAGAG			M. gastri
1100	TCTCATGTTGCCAGCGGGTAATGC	GGGGACTCGTGAGAG			M. gordonae
1061	TCTCATGTTGCCAGCACGTAATGGT	GGGGACTCGTGAGAG			M. marinum

	1250	1260	1270	1280	
1189	CAATGGCCGGTACAAAGGGCTGCGATGCCG	CGAGGTTAAG			M. tuberculosis
1328	CAATGGCCGGTACAAAGGGCTGCGATGCCG	CGAGGTTAAG			M. bovis
1224	CAATGGCCGGTACAAAGGGCTGCGATGCCG	TAGGTTAAG			M. avium
1176	CAATGGCCGGTACAAAGGGCTGCGATGCCG	CAAGGTTAAG			M. intracellulare
1218	CAATGGCCGGTACAAAGGGCTGCGATGCCG	TAAGGTTAAG			M. paratuberc.
1184	CAATGGCCGGTACAAAGGGCTGCGATGCCG	CAAGGTTAAG			M. scrofulaceum
1239	CAATGGCCGGTACAAAGGGCTGCGATGCCG	CAAGGTTAAG			M. leprae
1186	CAATGGCCGGTACAAAGGGCTGCGATGCCG	CGAGGTTAAG			M. kansasii
1187	CAATGGCCGGTACAAAGGGCTGCGATGCCG	CGAGGTTAAG			M. gastri
1220	CAATGGCCGGTACAAAGGGCTGCGATGCCG	CGAGGTTAAG			M. gordonae
1181	CAATGGCCGGTACAAAGGGCTGCGATGCCG	CGAGGTTAAG			M. marinum

Figure 2C

14/31

1290 1300 1310 1320

1229 CGAATCCTTA-AAGCCGGTCTCAGTTGGATCGGGTCT M.tuberculosis
1368 CGAATCCTTA-AAAGCCGGTCTCAGTTGGATCGGGTCT M.bovis
1264 CGAATCCTTAAAGCCGGACTCAGTTGGATCGGGTCT M.avium
1216 CGAATCCTTAAAGCCGGTCTCAGTTGGATCGGGTCT M.intracellulare
1258 CGAATCCTTAAAGCCGGACTCAGTTGGATCGGGTCT M.paratuberc.
1224 CGAATCCTTAAAGCCGGTCTCAGTTGGATCGGGTCT M.scrofulaceum
1279 CGAATCCTTAAAGCCGGTCTCAGTTGGATCGGGTCT M.leprae
1226 CGAATCCTTAAAGCCGGTCTCAGTTGGATCGGGTCT M.kansasii
1227 CGAATCCTTAAAGCCGGTCTCAGTTGGATCGGGTCT M.gastri
1260 CGAATCCTTAAAGCCGGTCTCAGTTGGATCGGGTCT M.gordonae
1221 CGAATCCTTAAAGCCGGTCTCAGTTGGATCGGGTCT M.marinum

1330 1340 1350 1360

1268 GCAACTCGACCCCGTGAAGTCGGAGTCGCTAGTAATCGCA M.tuberculosis
1407 GCAACTCGACCCCGTGAAGTCGGAGTCGCTAGTAATCGCA M.bovis
1304 GCAACTCGACCCCGTGAAGTCGGAGTCGCTAGTAATCGCA M.avium
1256 GCAACTCGACCCCGTGAAGTCGGAGTCGCTAGTAATCGCA M.intracellulare
1298 GCAACTAGACCCCGTGAAGTCGGAGTCGCTAGTAATCGCA M.paratuberc.
1264 GCAACTCGACCCCGTGAAGTCGGAGTCGCTAGTAATCGCA M.scrofulaceum
1319 GCAACTCGACCCCGTGAAGTCGGAGTCGCTAGTAATCGCA M.leprae
1266 GCAACTCGACCCCGTGAAGTCGGAGTCGCTAGTAATCGCA M.kansasii
1267 GCAACTCGACCCCGTGAAGTCGGAGTCGCTAGTAATCGCA M.gastri
1300 GCAACTCGACCCCGTGAAGTCGGAGTCGCTAGTAATCGCA M.gordonae
1260 GCAACTCGACCCCGTGAAGTCGGAGTCGCTAGTAATCGCA M.marinum

Figure 2D

15/31

50 60 70 80

128 TTCCGAACCCGGAAGCTAAGCTGCCAGCGCCGATGATAC *M. tuberculosis*
39 T~~G~~CCGAACCCGGAAGCTAAGCTGCCAGCGCCGATGATAC *M. bovis*
41 T~~G~~CCGAACCCGGAAGCTAAGCTGCCAGCGCC~~G~~ATGATAC *M. phlei*
3599 T~~A~~CCGAACCCGGAAGCTAAGCTG~~T~~CAGCGCCGATGATAC *M. leprae*
5743 T~~A~~CCGAACCCGGAAGCTAAGCTGCCAGC~~G~~CCGATGATAC *M. smegmatis*

90 100 110 120

168 T~~G~~CCC~~T~~CCCGGG---TGGAAAAGTAGGACACCGCCGAAC *M. tuberculosis*
79 T~~G~~CCCCTCCGGGG---TGGAAAAGTAGG~~G~~CACCGCCGAAC *M. bovis*
81 T~~G~~CCC~~T~~CAC~~G~~GGG---TGGAAAAGTAGGACACCGCCGAAC *M. phlei*
3599 T~~G~~CCC~~T~~T~~C~~GGG---TGGAAAAGTAGGACAC~~G~~CCGAAC *M. leprae*
5782 T~~A~~CCC~~T~~~~C~~GGG---TGGAAAAGTAGGACACCGCCGAAC *M. smegmatis*

Figure 3

16/31

	90	100	110	120	
382	GGGAGCTGTCAACCGAGC	ATT GATCCGAGGATTCCGAAT			M. avium
382	GGGAGCTGTCAACCGAGC	ATT GATCCGAGGATTCCGAAT			M. paratuberc.
1053	GGGAGCTGTCAACCGAGC	GT GATCCGAGGATTCCGAAT			M. tuberculosis
467	GGGAGCTGTCAACCGAGC	GT GATCCGAGGATTCCGAAT			M. phlei
392	GGGAGCTGTCAACCGAGC	GT GATCCGAGGATTCCGAAT			M. leprae
167	GGGAGCTGTCAACCGAGC	GT GATCCGAGGATTCCGAAT			M. gastri
110	GGGAGCTGTCAACCGAGC	GT GATCCGAGGATTCCGAAT			M. kansasii
2548	GGGAGCTGTCAACCGAGC	GT GATCCGAGGAT	TCC GAAT		M. smegmatis

	170	180	190	200	
462	GAATATATAGGGTGC	G GAGG	T AACGCGGGGAAGTGAAA		M. avium
462	GAATATATAGGGTGC	G GAGG	T AACGCGGGGAAGTGAAA		M. paratuberc.
1133	GAATATATAGGGTGC	G GAGG	T AACGCGGGGAAGTGAAA		M. tuberculosis
547	GAATATATAGG	CGT G	G GGGAACGCGGGGAAGTGAAA		M. phlei
472	GAATATATAGGGT	CG G	G GAGGGAACGCGGGGAAGTGAAA		M. leprae
247	GAATATATAGGGTGC	G GAGG	G AACGCGGGGAAGTGAAA		M. gastri
190	GAATATATAGGGTGC	G GAGG	G AACGCGGGGAAGTGAAA		M. kansasii
2628	GAATATATAGG	CGT C	G GGGAACGCGG	G GAAAGTGAAA	M. smegmatis

	250	260	270	280	
541	-GTCAGTAGTGGCGAGCGAAC	C CGGAACA	C GGCTAAACCG		M. avium
541	-GTCAGTAGTGGCGAGCGAAC	C CGGAACA	C GGCTAAACCG		M. paratuberc.
1212	-GCAAGTAGTGGCGAGCGAAC	C CGGAACA	C GGCTAAACCG		M. tuberculosis
626	-GTGAGTAGTGGCGAGCGAAC	A AGGGAGG	A TGGCTAAACCG		M. phlei
551	-GCAAGTAGTGGCGAGCGAAC	G TGGAA	T TGGCTAAACCG		M. leprae
326	-GTCAGTAGTGGCGAGCGAAC	G CGGAAC	A TGGCTAAACCG		M. gastri
269	-GTAAGTAGTGGCGAGCGAAC	G CGGAAC	A TGGCTAAACCG		M. kansasii
2706	G GTGAGTAGTGGCGAGCGAAC	A CGGGAGG	A TGGCTAAAC	G	M. smegmatis

Figure 4A

	290	300	310	320	
578	CATG-CATGGACA	ACCGGGTAGGGTTGTGTGCGGGGT			M. avium
578	CATG-CATGGACAACC	GGGTAGGGTTGTGTGCGGGGT			M. paratuberc.
1250	CA	G-CATGGTAACCGGGTAGGGTTGTGTGCGGGGT			M. tuberculosis
664	CGTG-CATGTGATACC	GGGTAGGGTTGTGTGCGGGTGT			M. phlei
590	CACA-CATGTCTAACT	AGGTAGGGTTGTGTGCGGGTGT			M. leprae
365	CAOG-CATGGGTGAC	GGGTAGGGTTGTGTGCGGGGT			M. gastri
308	CAOG-CATGGGTAA	CCGGTAGGGTTGTGTGCGGGGT			M. kansasii
2745	ATGACATGTGATACC	GGGTAGGGTTGTGTGCGGGGT			M. smegmatis

	330	340	350	360	
617	TGTGGGATTGATATG	TCTCAGCTCTACCTGGCTGAGG	GG		M. avium
617	TGTGGGATTGATATG	TCTCAGCTCTACCTGGCTGAGG	GG		M. paratuberc.
1289	TGTGGGAG-GATATG	TCTCAGCTACCGGGCTGAGA	GG		M. tuberculosis
703	TGTGGGCGCTGTGTGTC	CATCGTCCGCGGGCGATGGCAG			M. phlei
629	TGTGGGATTGGTATGTCT	CAACTCTACCTGGGAGG	GG		M. leprae
404	TGTGGGATCGATA	CGTCTCAGCTCTACCGGGCTGAGG	GG		M. gastri
347	TGTGGGATCGATA	CGTCTCAGCTCTACCGGGCTGAGG	GG		M. kansasii
2785	TGTGGGACCTATCTTC	CGCGCTCTACCTGGCTGAGGG			M. smegmatis

	370	380	390	400	
656	TAGTCAGAAAGTGT	CGTAGCGGAAGTGGCCTGGGAC			M. avium
656	TAGTCAGAAAGTGT	CGTAGCGGAAGTGGCCTGGGAC			M. paratuberc.
1327	AGTCAGAAAGTGT	CGTAGCGGAAGTGGCCTGGGAT			M. tuberculosis
742	TAGTAAAGCAGT	GTGGTTAGGTGAAGTGGCCTGGGAT			M. phlei
668	TAGTCAGAAAGTGT	CGTAGCGGAAGTGGCCTGGGAT			M. leprae
443	AGTCAGAAAGTGT	CGTAGCGGAAGTGGCCTGGGAT			M. gastri
386	AGTCAGAAAGTGT	CGTAGCGGAAGTGGCCTGGGAT			M. kansasii
2823	AGT	AGAAAATGTGTGGTTAGCGGAAATGGCTGGGAT			M. smegmatis

Figure 4B

18/31

410 420 430 440

696 GCCCCCCGTAGACGGTGAGAGCCC~~GGT~~TACGC~~G~~AAA-ACC *M. avium*
696 GGCCCCCGTAGACGGTGAGAGCCC~~GGT~~TACGC~~G~~AAA-ACC *M. paratuberc.*
1367 GGT~~CT~~GCCGTAGACGGTGAGAGCCC~~GGT~~TACGC~~G~~AAA-ACC *M. tuberculosis*
782 GG~~CT~~GCCGTAGTGGTGAGAGCCC~~T~~ACCGAAA-ACC *M. phlei*
708 GGCCCGTAGACGGTGAGAGCCC~~GGT~~ATACGC~~G~~AAA-~~G~~CC *M. leprae*
483 GGT~~CT~~GCCGTAGACGGTGAGAGCCC~~GGT~~TACGTGAAA-ACC *M. gastri*
426 GG~~CT~~GCCGTAGACGGTGAGAGCCC~~GGT~~TACGTGAAA-ACC *M. kansasii*
2863 GGCCCTCCGTAGACGGTGAGAGCCC~~GGT~~TACGTGAAA-ACC *M. smegmatis*

450 460 470 480

735 CGGCACCTGCCTTATATCAACACCGAGTAGCAGC~~GGG~~CC *M. avium*
735 CGGCACCTGCCTTTATATCAACACCCGAGTAGCAGC~~GGG~~CC *M. paratuberc.*
1406 CGGCACCTGCCTAG~~T~~ATCAACCGAGTAGCAGC~~GGG~~CC *M. tuberculosis*
820 GG~~CT~~GCGGTTCACAGG-TCCCGGAGTAGCAGC~~GGG~~CC *M. phlei*
747 GGGCACCTGCCTTGTATCAAATTCCCGGAGTAGCAGC~~GGG~~CC *M. leprae*
522 CGGCACCTGCCTTGTATCAAATTCCCGGAGTAGCAGC~~GGG~~CC *M. gastri*
465 CGGCACCTGCCTTGTATCAAATTCCCGGAGTAGCAGC~~GGG~~CC *M. kansasii*
2902 CGACGTCTGTCTTGATGGTTTCCCGGAGTAGCAGC~~GGG~~CC *M. smegmatis*

570 580 590 600

855 GAGGGAATGGTGAAAAGTACCCCGGGG~~GG~~AGGG-AGTGAAATA *M. avium*
855 GAGGGAATGGTGAAAAGTACCCCGGGG~~GG~~AGGG-AGTGAAATA *M. paratuberc.*
1526 GAGGGAATGGTGAAAAGTACCCCGGGG~~GG~~AGGG-AGTGAAAGA *M. tuberculosis*
937 GAGGGAAAT~~G~~TGGAAAGTACCCCGGGG~~GG~~AGGG-AGTGAAAGA *M. phlei*
867 GAGGGAATGGTGAAAAGTACCCCGGGG~~GG~~AGGG-AGTGAAATA *M. leprae*
642 GAGGGAATGGTGAAAAGTACCCCGGGG~~GG~~AGGG-AGTGAAAGA *M. gastri*
585 GAGGGAATGGTGAAAAGTACCCCGGGG~~GG~~AGGG-AGTGAAAGA *M. kansasii*
3022 GAGGGAATGGTGAAAAGTACCCCGGGG~~GG~~AGGG-AGTGAAAGA *M. smegmatis*

Figure 4C

19/31

	610	620	630	640	
894	GTACCTGAAACCGTGTGCCTACAATCCGTCA	GAGGC	TCCT		M. avium
894	GTACCTGAAACCGTGTGCCTACAATCCGTCA	GAGGC	TCCT		M. paratuberc.
1566	GTACCTGAAACCGTGTGCCTACAATCCGTCA	GAGGC	TCCT		M. tuberculosis
976	GTACCTGAAACCGTGTGCCTACAATCCGTCA	GAGGC	TCCT		M. phlei
907	GTACCTGAAACCGTGTGCCTACAATCCGTCA	GAGGC	TCCT		M. leprae
682	GTACCTGAAACCGTGTGCCTACAATCCGTCA	GAGGC	TCCT		M. gastri
625	GTACCTGAAACCGTGTGCCTACAATCCGTCA	GAGGC	TCCT		M. kansasii
3062	GTACCTGAAACCGTGTGCCTACAATCCGTCA	GAGGC	TCCT		M. smegmatis

	650	660	670	680	
934	C-----	GTGGGGTGTGATGGCGTGCCTTTGA			M. avium
934	C-----	GTGGGGTGTGATGGCGTGCCTTTGA			M. paratuberc.
1606	TTCCCTCTCCGGAGGG	GGTGTGATGGCGTGCCTTTGA			M. tuberculosis
1016	CTT-----	GTAGTGGGGTGTGATGGCGTGCCTTTGA			M. phlei
947	T-----	GTGGGGTGTGATGGCGTGCCTTTGA			M. leprae
722	T-----	GTGGGGTGTGATGGCGTGCCTTTGA			M. gastri
665	C-----	GTGGGGTGTGATGGCGTGCCTTTGA			M. kansasii
3102	ACGTGT-----	GTGGGGTGTGATGGCGTGCCTTTGA			M. smegmatis

	690	700	710	720	
959	AGAATGAGCCTGCGAGTCAGGGG	CACGTGCG	AGGTTAAC		M. avium
23	AGAATGAGCCTGCGAGTCAGGGG	ACACGTGCG	AGGTTAAC		M. intracellulare
959	AGAATGAGCCTGCGAGTCAGGGG	ACACGTGCG	AGGTTAAC		M. paratuberc.
1646	AGAATGAGCCTGCGAGTCAGGGG	ACATGTCG	AGGTTAAC		M. tuberculosis
4	AGAATGAGCCTGCGAGTCAGGGG	ACATGTCG	AGGTTAAC		M. bovis
1046	AGAATGAGCCTGCGAGTCAGGGG	ACATGTCG	AGGTTAAC		M. phlei
972	AGAATGAGCCTGCGAGTCAGGGG	ACATGTCG	AGGTTAAC		M. leprae
747	AGAATGAGCCTGCGAGTCAGGGG	ACATGTCG	AGGTTAAC		M. gastri
690	AGAATGAGCCTGCGAGTCAGGGG	ACATGTCG	AGGTTAAC		M. kansasii
3132	AGAATGAGCCTGCGAGTCAGGGG	ACATGTCG	AGGTTAAC		M. smegmatis

Figure 4D

20/31

	770	780	790	800	
1039	CGCATCCCCTTGGG-----		GTGTAGTGGCGTGT		M. avium
103	CGCATCCCCTTGGG-----		GTGTAGTGGCGTGT		M. intracellulare
1039	CGCATCCCCTTTGGG-----		GTGTAGTGGCGTGT		M. paratuberc.
1726	CGACCCACACGCGCATACGCGCGTGTGAATAGTGGCGTGT				M. tuberculosis
84	CGACCCACACGCGCATACGCGCGTGTGAATAGTGGCGTGT				M. bovis
1126	CGTATCCAACTGTT-----GGGGTTGGTGTAGTGGGTGTGT				M. phlei
1052	CGTATCACCGTGTGAGCGT-----GTGTAGTGGCGTGT				M. leprae
827	CGTATCACCGCGTAAGCGT-----GTGTAGTGGCGTGT				M. gastri
770	CGTATCGCGCGCGAGCGT-----GTGTAGTGGCGTGT				M. kansasii
3212	CGTATCCACACAAGAGTGTGTG-----GTGTAGTGGGTGTGT				M. smegmatis

	1050	1060	1070	1080	
1307	CAGCCAAACTCCGAATGCCG-TGGTG-TAAAAGGTGGCA				M. avium
1307	CAGCCAAACTCCGAATGCCG-TGGTG-TAAAAGCGTGGCA				M. paratuberc.
2005	CAGCCAAACTCCGAATGCCG-TGGTG-TAAAGCGTGGCA				M. tuberculosis
1401	CAGCCAAACTCCGAATGCCGATAAG-TGAAAAGGTGGCA				M. phlei
1323	CAGCCAAACTCCGAATGCCG-TGGT-TAAAAGCGTGGCA				M. leprae
1098	CAGCCAAACTCCGAATGCCG-TGGTG-TATA-GCGTGGCA				M. gastri
1041	CAGCCAAACTCCGAATGCCG-TGGTG-TATA-GCGTGGCA				M. kansasii
3486	CAGCCAAACTCCGAATGCCGTAAGGCCAAGAGTGGAA				M. smegmatis

	1170	1180	1190	1200	
1425	AGTGGAAAAGGATGTCTAGTCGCAGA-GACAACCAGGAGG				M. avium
1425	AGTGGAAAAGGATGTCTAGTCGCAGA-GACAACCAGGAGG				M. paratuberc.
2122	AGTGGAAAAGGATGTCTAGTCGCAGA-GACAACCAGGAGG				M. tuberculosis
1519	AGTGGAAAAGGATGTCTAGTCGCAGA-GACAACCAGGAGG				M. phlei
1441	AGTGGAAAAGGATGTCTAGTCGCAGA-GACAACCAGGAGG				M. leprae
1215	AGTGGAAAAGGATGTCTAGTCGCAGA-GACAACCAGGAGG				M. gastri
1158	AGTGGAAAAGGATGTCTAGTCGCAGA-GACAACCAGGAGG				M. kansasii
3606	AGTGGAAAAGGATGTCTAGTCGCAGA-GACAACCAGGAGG				M. smegmatis

Figure 4E

1250 1260 1270 1280

1504 CTCACTGGTCAAGTGATTATGCGCCGATAATGTAGCGGGGG M. avium
 1504 CTCACTGGTCAAGTGATTATGCGCCGATAATGTAGCGGGGG M. paratuberc.
 2201 CTCACTGGTCAAGTGATTGTGCGCCGATAATGTAGCGGGGG M. tuberculosis
 1598 CTCACTGGTCAAGTGATTGTGCGC[GATAATGTAGCGGGGG M. phlei
 1520 CTCACTGGTCAAGTGATTGTGCGCCGATAATGTAGCGGGGG M. leprae
 1294 CTCACTGGTCAAGTGATTGTGCGCCGATAATGTAGCGGGGG M. gastri
 1237 CTCACTGGTCAAGTGATTGTGCGCCGATAATGTAGCGGGGG M. kansasii
 3686 [TCACTGGTCAAGTGATTGTGCGCCGATA[TGT[GCGGGGG M. smegmatis

1290 1300 1310 1320

1544 CTCAAGCACACCGCCGAAGCCGCGGCACATTCATCTT-TA M. avium
 1544 CTCAAGCACACCGCCGAAGCCGCGGCACATTCATCTT-TA M. paratuberc.
 2241 CTCAAGCACACCGCCGAAGCCGCGGCACATTCATCTT-GT M. tuberculosis
 1638 CTCAAGCACACCGCCGAAGCCGCGGCACATTCAGCCTT-GT M. phlei
 1560 CTCAAGCACACCGCCGAAGCCGCGGCACATTCATCTT-TA M. leprae
 1334 CTCAAGCACACCGCCGAAGCCGCGAC[A-----ACCGC-A M. gastri
 1277 CTCAAGCACACCGCCGAAGCCGCGAC[A-----ACCGC-A M. kansasii
 3726 [TCAGCACACCGCCGAAGCCGCGGA[A-----GCCAACGTITG M. smegmatis

1330 1340 1350 1360

1583 CGGTGGATGTGGGTAGGGGAGCGTCCCCATTCAAGCGAAG M. avium
 1583 CGGTGGATGTGGGTAGGGGAGCGTCCCCATTCAAGCGAAG M. paratuberc.
 2280 TGGTGGATGTGGGTAGGGGAGCGTCCCCATTCAAGCGAAG M. tuberculosis
 1676 TGGCTGGTGTGGGTAGGGGAGCGTCC[GCACT[G[GGAAG M. phlei
 1600 GGGTGGATGTGGGTAGGGGAGCGT[GCTCATTCAAGCGAAG M. leprae
 1367 AGGT-----TGGGTAGGGGAGCGTCCCTCATTCAAGCGAAG M. gastri
 1310 AGGT-----TGGGTAGGGGAGCGTCCCTCATTCAAGCGAAG M. kansasii
 3764 TT-----TGGGTAGGGGAGCGTCC[G-AT[G[GGAAG M. smegmatis

Figure 4F

22/31

1370 1380 1390 1400

1623 CT-**CCGGGTGACCGGTGGTGGAGGGTGGGGGAGTGAGAAT** M. avium
1623 CT-**CCGGGTGA**T**CGGTGGTGGAGGGTGGGGGAGTGAGAAT** M. paratuberc.
2319 **CA**CCGGGTGACCGGTGGTGGAGGGTGGGGGAGTGAGAAT M. tuberculosis
1716 **CCGCCG**A**GTGA**T**CGGTGGTGGAGGGTGGAGTGAGAAT** M. phlei
1640 **CCTCCGGGT**A**ACCGGTGGTGGAGGGTGGGGAGTGAGAAT** M. leprae
1402 **CCGCCGGGTGACCGGTGGTGGAGG**A**TGGGGGAGTGAGAAT** M. gastri
1345 **CTECCGGGTGACCGGTGGTGGAGG**A**TGGGGGAGTGAGAAT** M. kansasii
3796 **CCGCCG**A**GTATCGA**T**GGTGGTGGAGGGTGGAGTGAGAAT** M. smegmatis

1530 1540 1550 1560

1781 CGATGGACAACGGGTTGATATTCCCGTACCCGTGT**ATGGG** M. avium
1781 CGATGGACAACGGGTTGATATTCCCGTACCCGTGT**ATGGG** M. paratuberc.
2479 CGATGGACAACGGGTTGATATTCCCGTACCCGTGT**GTGGG** M. tuberculosis
1875 CGATGGACAACGGGTTGATATTCCCGTACCCGTGT**ATGAG** M. phlei
1800 CGATGGACAACGGGTTGATATTCCCGTACCCGTGT**GTGAG** M. leprae
1562 CGATGGACAACGGGTTGATATTCCCGTACCCGTGT**GTGGG** M. gastri
1505 CGATGGACAACGGGTTGATATTCCCGTACCCGTGT**GTGGG** M. kansasii
3956 CGATGGACAACGGGTTGATATTCCCGTACCCGTGT**ATGAG** M. smegmatis

1570 1580 1590 1600

1821 **CGTCCCTGATGAATCA**-GCGGTACTAACCA**CCAAAACCG** M. avium
1821 CGTCCCTGATGAATCA-GCGGTACTAACCA**CCAAAACCG** M. paratuberc.
2519 CG**CCG**TGA**GAATCA**-GCGGTACTAACCA**CCAAAACCG** M. tuberculosis
1915 CGTCCCTGATGAATC**TCATTG**T**CTAACCA****CCAAAACCG** M. phlei
1840 CG**CCG**TGATGAATCA-GCGGTACTAACCA**CCAAAACCG** M. leprae
1602 CG**CCG**TGATGAATCA-GCGGTACTAACCA**CCAAAACCG** M. gastri
1545 CG**CCG**TGATGAATCA-GCGGTACTAACCA**CCAAAACCG** M. kansasii
3996 CGTCC**ATGATGAATCA**-GCGGTACTAACCA**CCAAAACCG** M. smegmatis

Figure 4G

23/31

	1610	1620	1630	1640	
1860	GAT-CGACCAT-T	CCCCTTCGGGGGC	C-GTGGCGATT-C	GG	M. avium
1860	GAT-CGACCAT-T	CCCCTTCGGGGC	GTGGCGATT-C	GG	M. paratuberc.
2558	GAT-CGATCAC	TCCCCTTCGGGG	TGTGGAGTTC	TGG	M. tuberculosis
1955	GCG-CGATC	ATCC	TTGGGG	GTGACGGTTG	GG M. phlei
1879	GAT-CGACCAT	TCCCCTTCGGGGC	TATGGAGGTT	CGG	M. leprae
1641	GAT-CGATCAC	TCCCCTTCGGGGC	GTGGAGGTC	TGG	M. gastri
1584	GAT-CGATCAC	TCCCCTTCGGGGC	GTGGAGGTC	TGG	M. kansasii
4035	ACCGTGACCG	GCAC	TTGGGG	TGTGGCG	TGG M. smegmatis
	1650	1660	1670	1680	
1896	GGCTCGTGG	GACCTTCG	TGGTAGTAGTC	AGCAATGGG	M. avium
1896	GGCTCGTGGG	ACCTTCG	TGGTAGTAGTC	AGCAATGGG	M. paratuberc.
2594	GGCTCGTGGG	ACCTTCG	TGGTAGTAGTC	AGCAATGGG	M. tuberculosis
1986	GGCTCGTGGG	ACCG	GTGGGTAGTAGTC	AGCGATGGG	M. phlei
1917	GGCTCGTGGG	ACCTCG	TGGTAGTAGTC	AGCGATGGG	M. leprae
1677	GGCTCGTGG	AGCCTTCG	TGGTAGTAGTC	AGCGATGGG	M. gastri
1620	GGCTCGTGG	AGCCTTCG	TGGTAGTAGTC	AGCGATGGG	M. kansasii
4071	GGCTCG	ATGGGAC	CTTCG	TGGTAGTAGTC	AGCGATGGG M. smegmatis
	1690	1700	1710	1720	
1936	-GTGACG	CAGGAAGG	CAGCGTACCA	GTCAAGTGGTAATA-	M. avium
1936	-GTGACG	CAGGAAGG	CAGCGTACCA	GTCAAGTGGTAATA-	M. paratuberc.
2634	-GTGACG	CAGGAAGG	TAGCGTACCA	GTCAAGTGGTAATA-	M. tuberculosis
2025	-GTGACG	CAGGAAGG	TAGCGTACCA	GTCAAGTGGTAATA-	M. phlei
1957	-GTGACG	CAGGAAGG	TAGCGTACCA	GTCAAGTGGTAATA-	M. leprae
1717	-GTGACG	CAGGAAGG	CAGCGTACCA	GTCAAGTGGTAATA-	M. gastri
1660	-GTGACG	CAGGAAGG	CAGCGTACCA	GTCAAGTGGTAATA-	M. kansasii
4111	-GTGACG	CAGGAAGG	TAGCGTACCA	GTCAAGTGGTAATA-	M. smegmatis
	1730	1740	1750	1760	
1974	-CTGGGGCAAGCC	CGTAG	--AGAGCG	GTAGGCAAATCCGT	M. avium
1974	-CTGGGGCAAGCC	CGTAG	--AGAGCG	GTAGGCAAATCCGT	M. paratuberc.
2672	-CTGGGGCAAGCC	CGTAG	GGAGAGCG	GTAGGCAAATCCGT	M. tuberculosis
2063	-CGGGG	AAACCG	TGTAGGG	GAGGTAGAGCAAATCCGT	M. phlei
1995	-CTGG	AGCAAGCC	GTAGGG	AGAGCG	GTAGGCAAATCCGT M. leprae
1755	-CTGGGGCAAGCC	AGCG	GTAGGG	AGAGCG	GTAGGCAAATCCGT M. gastri
1698	-CTGGGGCAAGCC	AGCG	GTAGGG	AGAGCG	GTAGGCAAATCCGT M. kansasii
4149	-CGG	GTAAAGCC	TGTAGGG	AGTCAGA	GTAGGCAAATCCGT M. smegmatis

Figure 4H

24/31

	1810	1820	1830	1840	
2051	CG-AATT CGGT GATCCTCTGCTGCCAAGAAAAGCCTCTA-				M. avium
2051	CG-AATT CGGT GATCCTCTGCTGCCAAGAAAAGCCTCTA-				M. paratuberc.
2751	CG-AATT CGGT GATCCTCTGCTGCCAAGAAAAGCCTCTA-				M. tuberculosis
2141	CG-AATT CGGT GATCCT T TGCTG T CGAGAAAAGCCTCTA-				M. phlei
2074	CG-AATT CGGT A GCTCTGCTGCCAAGAAAAGCCTCTA-				M. leprae
1834	CG-AATT CGGT GATCCTCTGCTGCCAAGAAAAGCCTCTA-				M. gastri
1777	CG-AATT CGGT GATCCTCTGCTGCCAAGAAAAGCCTCTA-				M. kansasii
4228	CG-AATT CGGT GATCCT T TGCTGCC G AGAAAAGCCTCTA-				M. smegmatis
	1850	1860	1870	1880	
2089	CGCAGG CACATACAC CGGCCGTACCCCAAACCAACACAGGT				M. avium
2089	CGCAGC CACATACAC CGCCGTACCCCAAACCAACACAGGT				M. paratuberc.
2789	CGCAGC CACAC CGGCCGTACCCCAAACCG G ACACAGGT				M. tuberculosis
2179	GC A AGC C CACATACACCGGCCGTACCCCAAACCAACACAGGT				M. phlei
2112	CGCAGC A ATGCGGCCGTACCCCAAACCG G ACACAGGT				M. leprae
1872	CGCAGC CACAC ACACGCCGTACCCCAAACCG G ACACAGG				M. gastri
1815	CGCAGC CACAC ACACGCCGTACCCCAAACCG G ACACAGGT				M. kansasii
4266	CGCAG G ACATACACGCCGTACCCCAAACCAACACAGGT				M. smegmatis
	1970	1980	1990	2000	
2208	AGGGGG CCCGGAATA ACCGTGAACACCC TT GC GG GGAGC				M. avium
2208	AGGGGG CCCGGAATA ACCGTGAACACCC TT GC GG GGAGC				M. paratuberc.
2908	AGGGGG A CCGGAATA T CGTGAACACCC TT GC GG GGAGC				M. tuberculosis
2298	AGGGGG GACC CACG T ACCGTGA GGC T CTTGCGG G GG G AGC				M. phlei
2231	AGGGGG G CCGGAATA T CGTGAACACCC TT GC GG GGAGC				M. leprae
1910					M. gastri
1934	AGGGGG A CCGGAATAACCGTGAACACCC TT GC GG GGAGC				M. kansasii
4385	AGGGGG GACC CAC A T GG CGT G T AAGC T T A CGGCCCAAGC				M. smegmatis
	2010	2020	2030	2040	
2248	GGGAT T CGGCC G CGCAGAAAACCAGTG GGT AGCGACT-GTTTA				M. avium
2248	GGGAT T CGGCC G CGCAGAAAACCAGTG GGG TAGCGACT-GTTTA				M. paratuberc.
2948	GGGAT G CGG T CGCAGAAAACCAGTG GAG AGCGACT-GTTTA				M. tuberculosis
2338	GGGG G GT GGG TGGC A AAACCAGTG GAG AGGAGCGACT-GTTTA				M. phlei
2271	GGGAT G CGG T CGCAGA G ACCACTG GAG AGCGACT-GTTTA				M. leprae
1910					M. gastri
1974	GGGAT T CGCAGAAAACCAGTG GAG AGCGACT T GTTTA				M. kansasii
4425	GG G A G T GGG TGGC A AAACCAGTG GAG AGCGACT-GTTTA				M. smegmatis

Figure 4I

25/31

2130 2140 2150 2160

2367 CCGTTAACCCGT--AAGGGTGAAGCGGAGAATTAAAGCCC M. avium
2367 CCGTTAACCCGT--AAGGGTGAAGCGGAGAATTAAAGCCC M. paratuberc.
3067 CCGTTAACCCGCG--AAGGGTGAAGCGGAGAATTAAAGCCC M. tuberculosis
2457 CCGTTAACCCCTTCGGGGTGAAGCGGAGAATTAAAGCCC M. phlei
2390 CCGTTAACCCGA--AAGGGTGAAGCGGAGAATTAAAGCCC M. leprae
1910 M. gastri
2094 CCGTTAACCCGC--AAGGGTGAAGCGGAGAATTAAAGCCC M. kansasii
4544 CCGTTAACCCCTTGGGGTGAAGCGGAGAATTAAAGCCC M. smegmatis

- - - -

2250 2260 2270 2280

2485 GTAACGACTTCCACTGTCTCAACCATACTCGCGAA M. avium
2485 GTAACGACTTCCCAACTGTCTCAACCATACTCGCGAA M. paratuberc.
3185 GTAACGACTTCTCAACTGTCTCAACCATACTCGCGAA M. tuberculosis
2577 GTAACGACTTCTCAACTGTCTCAACCATACTCGCGAA M. phlei
2508 GTAACGACTTCTCAACTGTCTCAACCATACTCGCGAA M. leprae
1910 M. gastri
2212 GTAACGACTTCTCAACTGTCTCAACCATACTCGCGAA M. kansasii
4663 GTAACGACTTCTCAACTGTCTAACATAGACTCGCGAA M. smegmatis

- - - -

2370 2380 2390 2400

2605 GTTCGGTACGGTTTGTGTAGGATAGGTGGGAGACTTTGAA M. avium
2605 GTTCGGTACGGTTTGTGTAGGATAGGTGGGAGACTTTGAA M. paratuberc.
3305 GTTCGGTACGGTTTGTGTAGGATAGGTGGGAGACTGTGAA M. tuberculosis
2697 GTCGATACGGTTTGTGTAGGATAGGTGGGAGACTGTGAA M. phlei
2628 GTTCGGTACGGTTTGTGTAGGATAGGTGGGAGACTGTGAA M. leprae
1910 M. gastri
2332 GTTCGGTACGGTTTGTGTAGGATAGGTGGGAGACTGTGAA M. kansasii
4782 GTCGATACGGTTTGTGTAGGATAGGTGGGAGACTGTGAA M. smegmatis

Figure 4J

26/31

	2410	2420	2430	2440	
2645	GCACAGACGCCAGTTGTTGAGTCGTTGAAATACC				M. avium
393	ATACAGACGCCAGTTGTTGAGTCGTTGAAATACC				M. intracellulare
2645	GCACAGACGCCAGTTGTTGAGTCGTTGAAATACC				M. paratuberc.
3345	ACCTCGACGCCAGTTGGGGGGAGTCGTTGAAATACC				M. tuberculosis
284	ACCTCGACGCCAGTTGGGGGGAGTCGTTGAAATACC				M. bovis
2737	GCTCGACGCCAGTTGGGGGGAGTCGTTGAAATACC				M. phlei
2668	ACTTCGACGCCAGTTGGGGGGAGTCGTTGAAATACC				M. leprae
1910					M. gastri
2372	ACCTCAACGCCAGTTGGGGAGTCGTTGAAATACC				M. kansasii
4822	GCTCACGCCAGTTGGGGAGTCGTTGAAATACC				M. smegmatis

	2450	2460	2470	2480	
2685	ACTCTGATCGTATTGGACACCTAACGTCGAACCCCT-TATC				M. avium
433	ACTCTGATCGTATTGGACACCTAACGTCGAACCCCT-TATC				M. intracellulare
2685	ACTCTGATCGTATTGGACACCTAACGTCGAACCCCT-TATC				M. paratuberc.
3385	ACTCTGATCGTATTGGGCACTAACGTCGAACCCCTGAATC				M. tuberculosis
324	ACTCTGATCGTATTGGGCACTAACGTCGAACCCCTGAATC				M. bovis
2777	ACTCTGATCGTATTGGGCACTAACGTCGAACCCCTGAATC				M. phlei
2708	ACTCTGATGTATTGAAACATCTAACGTCGAACCCCTGAATC				M. leprae
1910					M. gastri
2412	ACTCTGATCGTATTGGACACCTAACGTCGAACCCCTGAATC				M. kansasii
4862	ACTCTGATCGTATTGGCCTCTAACGTCGAACCCCTGAATC				M. smegmatis

- - - -

	2690	2700	2710	2720	
2924	GGTGTCACTCAACGGATAAAAGGTACCCGGGGATAACAG				M. avium
2924	GGTGTCACTCAACGGATAAAAGGTACCCGGGGATAACAG				M. paratuberc.
3625	GGTGTGCTCAACGGATAAAAGGTACCCGGGGATAACAG				M. tuberculosis
3017	GGTGTGCTCAACGGATAAAAGGTACCCGGGGATAACAG				M. phlei
2948	GGTGTGCTCAACGGATAAAAGGTACCCGGGGATAACAG				M. leprae
1910					M. gastri
2652	GGTGTGCTCAACGGATAAAAGGTACCCGGGGATAACAG				M. kansasii
5102	GGTGTGCTCAACGGATAAAAGGTACCCGGGGATAACAG				M. smegmatis

	2730	2740	2750	2760	
2964	GCTGATCTTCCCCAAGAGTCATATCGACGGGATGGTTG				M. avium
2964	GCTGATCTTCCCCAAGAGTCATATCGACGGGATGGTTG				M. paratuberc.
3665	GCTGATCTTCCCCAAGAGTCATATCGACGGGATGGTTG				M. tuberculosis
3057	GCTGATCTTCCCCAAGAGTCATATCGACGGGATGGTTG				M. phlei
2988	GCTGATCTTCCCCAAGAGTCATATCGACGGGATGGTTG				M. leprae
1910					M. gastri
2692	GCTGATCTTCCCCAAGAGTCATATCGACGGGATGGTTG				M. kansasii
5142	GCTGATCTTCCCCAAGAGTCATATCGACGGGATGGTTG				M. smegmatis

Figure 4K

27/31

	2770	2780	2790	2800	
3004	GCACCTCGATGTCGGCTCGTCGCATCCTGGGCTGGAGCA				M. avium
3004	GCACCTCGATGTCGGCTCGTCGCATCCTGGGCTGGAGCA				M. paratuberc.
3705	GCACCTCGATGTCGGCTCGTCGCATCCTGGGCTGGAGCA				M. tuberculosis
3097	GCACCTCGATGTCGGCTCGTCGCATCCTGGGCTGGAGCA				M. phlei
3028	GCACCTCGATGTCGGCTCGTCGCATCCTGGGCTGGAGCA				M. leprae
1910					M. gastri
2732	GCACCTCGATGTCGGCTCGTCGCATCCTGGGCTGGAGCA				M. kansasii
5182	GCACCTCGATGTCGGCTCGTCGCATCCTGGGCTGGAGCA				M. smegmatis
	2810	2820	2830	2840	
3044	GGTCCCAAGGTTGGCTGTTGCC-ATTAAAGCGGCAC				M. avium
3044	GGTCCCAAGGTTGGCTGTTGCC-ATTAAAGCGGCAC				M. paratuberc.
3745	GGTCCCAAGGTTGGCTGTTGCC-ATTAAAGCGGCAC				M. tuberculosis
3137	GGTCCCAAGGTTGGCTGTTGCC-ATTAAAGCGGCAC				M. phlei
3068	GGTCCCAAGGTTGGCTGTTGCC-ATTAAAGCGGCAC				M. leprae
1910					M. gastri
2772	GGTCCCAAGGTTGGCTGTTGCC-ATTAAAGCGGCAC				M. kansasii
5222	GGTCCCAAGGTTGGCTGTTGCC-ATTAAAGCGGCAC				M. smegmatis
	3050	3060	3070	3080	
3283	CAAGATCAGGTTT-CTCACCCATTAGGATAAGGCC				M. avium
638	CAAGATCAGGTTT-CTCACCCATTAGGATAAGGCC				M. intracellulare
3283	CAAGATCAGGTTT-CTCACCCATTAGGATAAGGCC				M. paratuberc.
3984	CAAGATCAGGTTT-CTCACCCACTTGGTGGGATAAGGCC				M. tuberculosis
570	CAAGATCAGGTTT-CTCACCCACTTGGTGGGATAAGGCC				M. bovis
3376	CAAGAAGCAGGATT-CTCACCCCTAGGAGGGATAAGGCC				M. phlei
3307	CAA				M. leprae
1910					M. gastri
3011	CAAGATCAGGATT-CTCACCCACTTGGGATAAGGCC				M. kansasii
5462	CAAGAAGCAGGATT-CTCACCCCTAGGAGGGATAAGGCC				M. smegmatis
	3090	3100	3110	3120	
3322	CCCGC-AGACCACGGGATTGATAGGCAGACCTGGAAAGCT				M. avium
677	CCCGC-AGACCACGGGTTGATAGGCCAGACCTGGAAAGCT				M. intracellulare
3322	CCCGC-AGATCACGGGATTGATAGGCCAGACCTGGAAAGCT				M. paratuberc.
4023	CCCGC-AGAACACGGGTTCAATAGGTCAGACCTGGAAAGCT				M. tuberculosis
609	CCCGC-AGAACACGGGTTCAATAGGTCAGACCTGGAAAGCT				M. bovis
3415	CCCGC-AGACCACGGGATGATAGACCAGACCTGGAAAGCT				M. phlei
3309					M. leprae
1910					M. gastri
3050	CCCGC-AGAACACGGGTTGATAGGCCAGACCTGGAAAGCT				M. kansasii
5501	CCCGC-AGACCACGGGATTGATAGACCAGACCTGGAAAGCT				M. smegmatis

Figure 4L

28/31

	130	140	150	160	
107	GAGTAACACGTGGG	CA	ATCTGCCCTGCACTTC	-GGGATAAA	M. avium
59	GAGTAACACGTGGG	CA	ATCTGCCCTGCACTTC	-GGGATAAA	M. intracellulare
107	GAGTAACACGTGGG	CA	ATCTGCCCTGCACTTC	-GGGATAAA	M. paratuberc.
70	GAGTAACACGTGGG	CA	ATCTGCCCTGCACTTC	-GGGATAAA	M. scrofulaceum
70	GAGTAACACGTGGG	CA	ATCTGCCCTGCACTTC	-GGGATAAA	M. tuberculosis
209	GAGTAACACGTGGG	CA	ATCTGCCCTGCACTTC	-GGGATAAA	M. bovis
120	GAGTAACACGTGGG	CA	ATCTGCCCTGCACTTC	-GGGATAAA	M. leprae
69	GAGTAACACGTGGG	CA	ATCTGCCCTGCACTTC	-GGGATAAA	M. kansasii
70	GAGTAACACGTGGG	CA	ATCTGCCCTGCACTTC	-GGGATAAA	M. gastri
104	GAGTAACACGTGGG	CA	ATCTGCCCTGCACTTC	-GGGATAAA	M. gordonae
64	GAGTAACACGTGGG	CA	ATCTGCCCTGCACTTC	-GGGATAAA	M. marinum

	450	460	470	480	
424	AAACCTTT	CACCATCGACGAAGGTCCGGG	TTTT	CTCGG	M. avium
376	AAACCTTT	CACCATCGACGAAGGTCCGGG	TTTT	CTCGG	M. intracellulare
424	AAACCTTT	CACCATCGACGAAGGTCCGGG	TTTT	CTCGG	M. paratuberc.
387	AAACCTTT	CACCATCGACGAAGGTCTCA	---	CTTG	M. scrofulaceum
389	AAACCTTT	CACCATCGACGAAGGTCCGGG	TTCT	CTCGG	M. tuberculosis
528	AAACCTTT	CACCATCGACGAAGGTCCGGG	TTCT	CTCGG	M. bovis
439	AAACCTTT	CACCATCGACGAAGGTCTGGG	ATT	CTCGG	M. leprae
386	AAACCTTT	CACCATCGACGAAGGTCCGGG	TTCT	CTCGG	M. kansasii
387	AAACCTTT	CACCATCGACGAAGGTCCGGG	TTCT	CTCGG	M. gastri
420	AAACCTTT	CACCATCGACGAAGGTCCGGG	TTCT	CTCGG	M. gordonae
381	AAACCTTT	CACCATCGACGAAGGTCTGGG	TTCT	CTCGG	M. marinum
	490	500	510	520	
429	ATTGACGGTAGGTGGAGAAGAAGCACC	GGCCA	ACTAC	GTG	M. tuberculosis
568	ATTGACGGTAGGTGGAGAAGAAGCACC	GGCCA	ACTAC	GTG	M. bovis
464	ATTGACGGTAGGTGGAGAAGAAGCACC	GGCCA	ACTAC	GTG	M. avium
416	ATTGACGGTAGGTGGAGAAGAAGCACC	GGCCA	ACTAC	GTG	M. intracellulare
464	ATTGACGGTAGGTGGAGAAGAAGCACC	GGCCA	ACTAC	GTG	M. paratuberc.
424	ATTGACGGTAGGTGGAGAAGAAGCACC	GGCCA	ACTAC	GTG	M. scrofulaceum
479	ATTGACGGTAGGTGGAGAAGAAGCACC	GGCCA	ACTAC	GTG	M. leprae
426	ATTGACGGTAGGTGGAGAAGAAGCACC	GGCCA	ACTAC	GTG	M. kansasii
427	ATTGACGGTAGGTGGAGAAGAAGCACC	GGCCA	ACTAC	GTG	M. gastri
460	ATTGACGGTAGGTGGAGAAGAAGCACC	GGCCA	ACTAC	GTG	M. gordonae
421	ATTGACGGTAGGTGGAGAAGAAGCACC	GGCCA	ACTAC	GTG	M. marinum

Figure 5A

29/31

1130 1140 1150 1160

1104 TCTCATGTTGCCAGGGTAATGC~~G~~GGGGACTCGTGAGAG M. avium
1056 TCTCATGTTGCCAGCGGGTAATGCCGGGACTCGTGAGAG M. intracellulare
1098 TCTCATGTTGCCAGCGGGTAATGC~~G~~GGGGACTCGTGAGAG M. paratuberc.
1064 TCTCATGTTGCCAGCGGGTAATGCCGGGACTCGTGAGAG M. scrofulaceum
1069 TCTCATGTTGCCAG~~G~~GTAA~~T~~GGTGGGGACTCGTGAGAG M. tuberculosis
1208 TCTCATGTTGCCAGCACGTAATGGTGGGGACTCGTGAGAG M. bovis
1119 TCTCATGTTGCCAG~~G~~GTAA~~T~~GGTGGGGACTCGTGAGAG M. leprae
1066 TCTCATGTTGCCAGCGGGTAATGCCGGGACTCGTGAGAG M. kansasii
1067 TCTCATGTTGCCAGCGGGTAATGCCGGGACTCGTGAGAG M. gastri
1100 TCTCATGTTGCCAGCGGGTAATGCCGGGACTCGTGAGAG M. gordonae
1061 TCTCATGTTGCCAG~~G~~GTAA~~T~~GGTGGGGACTCGTGAGAG M. marinum

1290 1300 1310 1320

1264 CGAAC~~T~~CTTTAAAGCCGGACTCAGTTCGGATTGGGTCT M. avium
1216 CGAAC~~T~~CTTTAAAGCCGG~~T~~TCAGTTCGGATTGGGTCT M. intracellulare
1258 CGAAC~~T~~CTTTAAAGCCGGACTCAGTTCGGATTGGGTCT M. paratuberc.
1224 CGAAC~~T~~CTTTAAAGCCGG~~T~~TCAGTTCGGATCGGGTCT M. scrofulaceum
1229 CGAAC~~T~~CTTA-AAAGCCGG~~T~~TCAGTTCGGATCGGGTCT M. tuberculosis
1368 CGAAC~~T~~CTTA-AAAGCCGG~~T~~TCAGTTCGGATCGGGTCT M. bovis
1279 CGAAC~~T~~CTTTAAAGCCGG~~T~~TCAGTTCGGATCGGGTCT M. leprae
1226 CGAAC~~T~~CTTTAAAGCCGG~~T~~TCAGTTCGGATCGGGTCT M. kansasii
1227 CGAAC~~T~~CTTTAAAGCCGG~~T~~TCAGTTCGGATCGGGTCT M. gastri
1260 CGAAC~~T~~CTTTAAAGCCGG~~T~~TCAGTTCGGATCGGGTCT M. gordonae
1221 CGAAC~~T~~CTTAAAGCCGG~~T~~TCAGTTCGGATCGGGTCT M. marinum

1330 1340 1350 1360

1304 GCAACTCGACCC~~C~~ATGAAGTCGGAGTCGCTAGTAATCGCA M. avium
1256 GCAACTCGACCC~~C~~ATGAAGTCGGAGTCGCTAGTAATCGCA M. intracellulare
1298 GCAACT~~A~~ACCC~~C~~ATGAAGTCGGAGTCGCTAGTAATCGCA M. paratuberc.
1264 GCAACTCGACCC~~C~~GTGAAGTCGGAGTCGCTAGTAATCGCA M. scrofulaceum
1268 GCAACTCGACCC~~C~~GTGAAGTCGGAGTCGCTAGTAATCGCA M. tuberculosis
1407 GCAACTCGACCC~~C~~GTGAAGTCGGAGTCGCTAGTAATCGCA M. bovis
1319 GCAACTCGACCC~~C~~GTGAAGTCGGAGTCGCTAGTAATCGCA M. leprae
1266 GCAACTCGACCC~~C~~GTGAAGTCGGAGTCGCTAGTAATCGCA M. kansasii
1267 GCAACTCGACCC~~C~~GTGAAGTCGGAGTCGCTAGTAATCGCA M. gastri
1300 GCAACTCGACCC~~C~~GTGAAGTCGGAGTCGCTAGTAATCGCA M. gordonae
1260 GCAACTCGACCC~~C~~GTGAAGTCGGAGTCGCTAGTAATCGCA M. marinum

Figure 5B

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Magnium 23S:

2550 2568 2569 2568 2569 2589
 TTACGGCCGAGGACGAAAAAGACCCCCGGACCTCACTA

Figure 6

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M. tuberculosis 16S:

441 |
452 |
TGGAAGAACACCGGCCAACTACGTGCCAGCAGCCGTAATACTAG
473 474 477 | |
491 |

843 |
865 866 |
GTACGGCCGCAAGGCTAAACTCAAGGAATTGACGGGGC
883 |

Figure 7